

ELECTRONIC & TECHNICAL SERVICES Ltd

INSTALLATION AND USER MANUAL

E&TS IRRIGATION CONTROLLERS

Thank you for purchasing an ETS Irrigation controller

If treated in accordance with the following instructions it should give a long and trouble free service.

OPERATIONAL FEATURES

- 1) The digital clock has large bright red digits and is easy to read.
- 2) 8 programmable starts per day, seven days per week; a total of up to 56 starts per week.
- 3) Those starts can be set for each day from 1 up to 8 in any sequence, or for a week at a time with "day omission."
- 4) It is recommended that no more than 2 valves be connected per station in serial configuration and one valve connected per station in parallel configuration. Each valve is individually time in the parallel configuration.
- 5) Valve base times from 10s of minutes to 1 second, or to 0.2 seconds for misting.
- 6) Various types of rainfall sensor can be attached and used to over-ride or integrate external irrigation.
- 7) Continual cycling is available for misting. No difficult programming is required. Simply connect the Mist controller output into the terminal block labelled "Latched input." Weening can be achieved by fitting an ETS Mist Wean controller.
- 8) An irrigation cycle can be initiated by an external start device which connects the terminal blocks "labelled Mom latch."
- 9) Watering by 'hand' when a solenoid valve is connected to the 'Hand watering' terminal block and to the Common terminal.
Pump can be selected from the front panel to run or to be turned off
Feed Valve, if available can also be selected.
- 10) When the panel is running the pump can be turned on or off from the front panel by pushing the tactile switch labelled 'pump'. The pump 'state' will be stored in memory and applied the next time that the panel runs
- 11) Error checking systems continuously monitor the condition of the rotary switches and look for open or shorted solenoid valve circuits. A built-in sounder, Status LED and station indicator give warning of any error condition, pulsing at a rate specific for the error condition.
- 12) The duration of all irrigation times can be altered manually by the "Percentage \pm control" between -90% and +100%.
- 13) Evaporation or humidity sensors with an output of 0-5Vdc or 0-20mA dc are sampled, integrated and averaged. The algorithm calculates the adjusted irrigation time per station from the output of the sensor.
- 14) Stations are 'skipped' if set above zero with no valve attached. The error checking system will warn of an open circuit valve at the end of the irrigation cycle.
- 15) The Feed valve can be programmed to any station in serial and to banks of four in parallel.
- 16) Single station serial operation or single parallel bank operation.

MOUNTING AND WIRING UP THE CONTROLLER

REFER TO FIG.3

Remove the four screws holding the front panel to the rear enclosure.

WITH GREAT CARE remove the three flat ribbon cables from their respective sockets. Please note these are 'keyed' and can only be inserted one way. Refit the cables when wiring complete.

The controller should be mounted on a flat surface and secured by bolts screwed through the holes provided in each corner of the box. **Do not** make other holes in the box for this purpose.

The ETS controllers should be wired in accordance with FIG.3.

IMPORTANT

Ensure that the mains supply is disconnected before wiring the controller.

Ensure that the mains supply is clean, and that there are no inductive loads such as large pumps or motors on the same supply. It is recommended that the controller be wired directly to the main distribution board.

We recommend that you protect the controller with an RCD rated at 2 Amps.

Connect:-

The 240Vac live (brown) wire to the fused terminal block labelled **L**,

The neutral (blue) to the terminal block labelled **N**,

The earth (green and yellow) to the terminal block labelled **E**.

Ensure that the Earth terminal runs to a bonded metal pipe or to a dedicated earth rod, and that the impedance to earth is <5 Ohms.

CONNECTING SOLENOID VALVES

Connect the solenoid valve 1 to terminal 1, solenoid valve 2 to terminal 2, and so on for the remaining valves.

Connect the other wire from each of the solenoids to a common return. The terminal blocks for this are labelled **COMM**.

In the U K it is a statutory requirement that you keep all the low voltage cables clear of the 240vac high voltage supply, in accordance with the Low Voltage Directive. Please take care to do this!

CONNECTING THE PUMP

The pump cannot be driven directly from the controller. Use an appropriate relay with a 24Vac coil, and connect the relay coil across terminals **PUMP** and **COMM**.

MORE EXTERNAL INPUTS AND OUTPUTS

CONNECTING THE FEED VALVE

Connect the solenoid valve across the terminal block labelled **FEED** and the return to **COMM**

REMOTE STOP, LOW RESERVOIR CUT OUT

A closed contact across the terminals labelled **Lo res/0V**, **Lo res** will suspend the program. The alarm led will flash and the sounder will beep on/off until the low reservoir fault condition is removed. The program will continue from point of suspension.

If a float switch is fitted in the water reservoir and connected to the **Lo res** contacts, the program will be suspended when the water level in the reservoir drops below the float switch, causing contact closure. The program will remain suspended until the water level increases above the float switch and opens the contacts.

REMOTE STARTS

There are two kinds of remote starts: momentary and cycling/latched.

1. A momentary start device, such as a closed contact or the output from an Evaporimeter wired across terminals labelled **MOMENTARY** and **common arrow point** will start an irrigation program once. The clock display will thereupon read **PS1** for no more than four seconds. **PS1** indicates that the start has been from an external source

2. A latched or cycling start can be initiated by a suitable device wired across terminals labelled **LATCH** and **common arrow point**. The controller will operate the program for as long as these contacts are closed and can be used for misting, multiple cycling and for pulsed irrigation programs. The display will constantly read **PS1**.

HAND WATERING

A permanent 24v AC supply is available across **HANDWATER** and **COMM**. When this supply is healthy the LED labelled **ValveSupply OK** is illuminated.

Hand watering can be accomplished in two ways:

- i) pump, selected by pushing the **Pump Control** push button.
- ii) pump and feed (where applicable) by selecting **Feed Valve** push button.

The pump and feed valve can be turned on/off by repeated pushes on their respective buttons.

The feed valve will always turn off when the pump is turned off.

The manual start from the clock is inhibited when hand watering, the automatic start sequence from the clock is not affected.

SETTING THE GRASLIN CLOCK

Clock has been pre wired, please refer to the manufacturers instructions for clock setting.

NOTE. When the clock slide switch is in the 'ON' up position, external starts i.e. momentary starts and latched starts are ignored.

When the switch is in the 'AUTO', middle, or 'OFF', down position, external starts will be accepted.

The external latched start initiates a single cycle similar to the momentary start.

OPERATIONAL FEATURES IN DETAIL:

Initial Automatic audit.

When power is applied the controller signs on with a signature tune. This indicates that the program is fully functional. The **power/int sample** led will be illuminated, indicating a healthy 5Vdc power supply

SETTING THE DIGITAL CLOCK (See FIG 1)

You can set the 24 hour seven day digital time clock to the local time; days, hours x10, hours, minutes x10, and minutes. The battery-backed time base is crystal-controlled and highly accurate; the local time is updated every minute. If the mains power should fail, the re-chargeable battery back-up will ensure accurate time keeping for a minimum of seven days.

There are 8 automatic programmable start times. Start times can be set individually or in blocks. The sequence program can be started automatically or manually from the clock. The clock can be reset manually and a new time and day can be programmed if so desired.

The clock program operates a number of safeguards to provide a high degree of fail-safe operation. If the clock software detects a problem, the MINS the MINSx10 and the DAY displays will be visible while the error is being corrected automatically.

If in the unlikely event that the clock completely 'freezes' and pushing the clock set buttons has no effect, remove the jumper labelled **CLOCK SUICIDE RESET** located on the rear of the main control board FIG.2. This will remove all power from the clock, wait for 2 seconds and replace jumper. All stored information will have been lost, the clock will have to be re-programmed. A reset action after removal and replacement of the clock suicide jumper will prevent a spurious irrigation cycle.

Your clock will have been set at the factory, and the local time should not require setting. However should you wish to alter the time, or simply familiarise yourself with the workings, here is a step by step guide:

Note: if you reset the clock, or if the clock has never been set, the display will flash. This is perfectly normal.

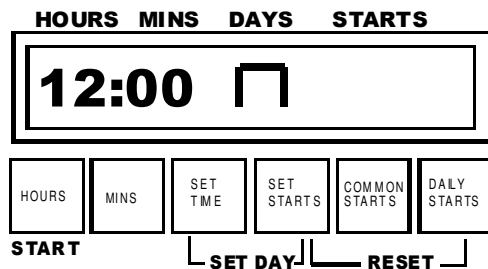
Setting the time is the only complicated procedure on this controller. However, if you can set an alarm clock you will have absolutely no problem in setting this one. The clock displays the time in the 24 hour format.

Clock access is inhibited when an irrigation sequence is running.

TIME DOES NOT AUTOMATICALLY ADJUST FOR BST AND GMT

The days will be displayed as follows:

□ = MONDAY **t** = TUESDAY **U** = WEDNESDAY **t.** = THURSDAY
F = FRIDAY **S** = SATURDAY **S.** = SUNDAY



By default for a new clock, hours, minutes and days will flash

As an example it is **Tuesday** and the time is to be set to **15:30** hours.

Setting the Local Time.

1. Push and hold the button **SET TIME** Then push the button labelled **HOURS**

The hours display will increment (count upwards). When the clock shows **15:00** release the **HOURS** push button. **If you release the SET TIME push button before the HOURS push button a manual start sequence will be initiated. If this is a problem push the reset button to terminate the Sequence**

2. Now push the button labelled **MINS** The minutes display will increment. When **30** is displayed, release the **MINS** and the **SET TIME** push buttons. The local time is now set.

Next, program the action window which displays the Day, stored starts and the start information.

1. To set the day, which by default is set to Monday (always displayed as **□** in the **DAYS** window) push and hold the button labelled **SET TIME** followed by

SET STARTS

When both buttons are held down, the days display will increment from Monday through to Sunday. When the correct day is displayed, release **SET START** followed by **SET TIME**. Local time and date are now set.

HOURS	MINS	DAYS	STARTS
15:30 t			
HOURS	MINS	SET TIME	SET STARTS
START		SET DAY	RESET

If you make a mistake at any time, simply repeat the above setting procedure. If you want to clear everything back to the default level push the button labelled

**DAILY
STARTS**

and the push button labelled

**SET
STARTS**

together.

Setting Start Times.

When the correct time and day of the week are displayed, the start times can be programmed.

The COMMON STARTS button saves you a lot of time because it allows you to apply a common start time to a particular program for up to seven days. Thus, if you programmed a start for 06:30 on Monday, the same start time can be programmed for Tuesday, Wednesday, Thursday, etc through to Sunday, by one touch of the button.

The DAILY STARTS button allocates an individual start time to be programmed for a particular day of the week.

As an example set the first start time to 06:30 hours

1. Push and hold the button labelled

**SET
STARTS**

the real time display will show 00:00. tS1.

To set the hours push and hold down **SET STARTS** and

HOURS

until 06 is displayed.
Release the **HOURS** push button.

2. Next, push and hold down **SET STARTS** and

MINS

until 30 is displayed.
Release the **MINS** pushbutton

When you are satisfied that the first start time is correct, release the **SET STARTS** push button.

Now allocate that start time to just one day by pushing the

**DAILY
START**

button,

or to all 7 days by pushing the

**COMMON
STARTS**

button. To check, release **SET STARTS** push

button and press the

**DAILY
STARTS**

again to scroll through stored start times

HOURS	MINS	DAYS	STARTS
06:30 t S 1			

HOURS	MINS	SET TIME	SET STARTS	COMMON STARTS	DAILY STARTS
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START SET DAY RESET

The action window should now show the following information: 06:30 tS1 This shows the first start time has been programmed for 06:30 on Tuesday. You can either program the remaining seven starts in the manner described or leave them unused. Keeping the **DAILY STARTS** pushbutton pressed will scroll through the remaining seven starts all should display **00:00**, through to Wednesday which should show the first start time as **06:30 Ls1**, scroll through to Thursday, **06:30 t.S1** etc for the rest of the week.

The second start time will now be displayed as **06:30 t S2**. this shows that the previous start time has been set has been set at **06:30** and the clock is now waiting for the 2nd start time, pushing either common starts or the daily start will be ignored until a new start time is entered that is different to the first start time, e.g. a new start time of **06:31** will be accepted

Note that only one start time will be selected by pushing either **COMMON STARTS** or **DAILY START**, Otherwise the same start would be allocated to all start times.

All unused starts should be set at **00:00**, which is ignored as a start time. If you want to start an irrigation sequence at midnight, set the nearest start time to either **23:59** or **00:01**. All other times are permitted.

You can program as many starts as you like up to the maximum permitted of eight starts. It is not the sequence of starts that determine the irrigation cycles but the times programmed. For instance if you program start eight with a time of 06:00 hours and start one with 07:00 hours, start eight will run the first irrigation cycle followed by start one.

Once all starts have been programmed, to see and confirm your start times push the button

labelled

**DAILY
STARTS**

this will sequence through days and related start times.

A mixture of **COMMON STARTS** and **DAILY STARTS** is allowed. For instance you may wish to have common starts for Monday, Tuesday and Wednesday but different starts for the remaining 4 days.

1. Sequence through to the day by pushing the **DAILY STARTS** button,
2. Push the **SET STARTS** button, select the start time and accept by pushing the **DAILY STARTS** push button.
3. When you are satisfied with all start times push the

**SET
TIME**

button, which will return the display to the local time and day.

SETTING THE IRRIGATION CYCLE

Setting the irrigation cycle is very simple.

1) Set the time base required by turning the TIME BASE rotary switch to the desired time base:- 0.2SECS, SECS, SECS X 10 , MINS, or MINS X 10.

2) Set the station multiplier to the desired setting from 0 to 9. When a particular knob is set to zero, that valve will not be operated, and the controller moves through to the next set station.

For example, if the TIME BASE is set to SECS and STN 1 is set to 3 Valve 1 will be on for 3 seconds.

3) Set all remaining stations in the same manner.

SEQUENTIAL OPERATION

This mode is normally used on smaller controllers. To run it, remove the jumper from the terminals labelled **PARALLEL** (located on the lower left centre of the rear board, as shown in fig2).

When the program runs, the LED for station 1 will be illuminated and voltage will be supplied to valve 1, which should open! At the end of the time set, LED 1 will extinguish and valve 1 will close. The program will sequence to station 2, the LED for which will be illuminated, and valve 2 should open. This process is repeated for each station in turn.

PARALLEL OPERATION

This mode is particularly useful for larger controllers. To run it, fit the jumper to the terminals labelled **PARALLEL**, as above. Four stations will operate at the same time, each for the length of time set when it was programmed.

When a program starts, the LED's for stations 1, 2, 3 and 4 will be illuminated and the respective 4 valves will open. As the stations time out the respective station indicator and valve will close. If all the stations are set to the same time all valves and station indicators will open and close together.

With the 16 station controller bank 1 stations 1 to 4 come on first followed by bank 2 stations 5 to 8, bank 3 stations 9 to 12 and finally bank 4 stations 13 to 16. 24 through to 48 stations operate in the same manner

PROGRAMMING FOR FEED.

The software allows the **FEED VALVE** to be programmed for every station. The **FEED** can be programmed on or off. When the panel is in a quiescent state pushing the **ADVANCE** button will illuminate station one and the **FEED VALVE** led indicators. If feed is to be applied on station one push the **ADVANCE** button, **FEED VALVE** led will flash twice and the sounder will beep twice, station two led indicator is now illuminated. If feed is not required on this station, push the **FEED VALVE** push button, **FEED VALVE** led will flash once, then extinguish and the sounder will beep once, push the **ADVANCE** button, station three indicator will be illuminated. Carry on programming in this manner to the sixteenth station.

In parallel the feed valve is common to the bank of four stations.

Once programming is complete, push the **ADVANCE** button to check stored **FEED VALVE** data. Stored **FEED VALVE** data is retained indefinitely in the event of a power failure.

Note that when the feed valve has been selected in a sequence, the **FEED** led flashes twice, the sounder beeps twice. If feed has not been selected the **FEED** led does not flash and the sounder is silent.

INITIATION OF AN IRRIGATION CYCLE

An irrigation cycle can be initiated in three ways:

- 1) By a timed automatic start.
- 2) By a manual start.
- 3) By a remote start.

A timed start from the digital clock has been explained in: SETTING THE DIGITAL CLOCK.

When the clock initiates a start, the display will show both the real time and what it is doing, displayed for example as **FS1** (Friday start 1.) This will be displayed for up to 4 seconds (the clock interrupt routine). Then the action is cleared from the display, which reverts to local time.

The manual start from the clock is inhibited when hand watering, the automatic start sequence from the clock is not affected.

EXTERNAL STARTS

Any device which makes contact across the terminals labeled **MOM LATCH** or **LATCH** can be used to start the irrigation program remotely. **MOM** is generally used for starting irrigation programs, whilst **LTH** is generally used to start Misting or cycling programs.

PROGRAM ADVANCE

When the irrigation program is running, pushing the Program **ADVANCE** button will advance the program to the next station. In parallel the next bank is selected.

ALTERING PROGRAM SETTINGS

These can be done whilst the program is running, simply by increasing or decreasing the station time, or by selecting a new time base. If you want one station to stop operating, simply set the knob to 0.

PUMP

The pump output is selected by pushing the **PUMP CONTROL** button when the program runs. This state is always remembered even when the panel is turned off. This also applies if the pump has been programmed off. The PUMP led indicator is lit when the pump is running. This output can also be used to operate a master valve, a fertilizer injector or similarly related equipment.

STATUS

When all is healthy the **TIMER/PULSE** led will flash at the time base rate, for instance if the time base is set to 1 second the **TIMER/PULSE** led will flash at 1 second intervals.

SINGLE STATION (serial) SINGLE BANK (parallel)

Initiate an irrigation cycle. Push the **ADVANCE** to select the station or bank to be irrigated. Push the **FEED VALVE** push button once, the sounder and Alarm led will bleep and flash twice. The selected station/bank will irrigate once and when complete the irrigation cycle will reset. **This feature has to be selected every time an irrigation cycle is initiated.**

Note. pushing the FEED VALVE during an irrigation cycle will reset the irrigation cycle after the current station has finished watering.

DIAGNOSTICS (prevention of glass house flooding)

These are carried out automatically when the program is initiated. The program checks for open circuit switches. At the end of the irrigation cycle the faulty switch is identified by the station indicator. If station 3 switch is faulty, station 3 led and sounder will beep and flash twice. This applies to all 16 stations. Once the fault condition has been rectified sounder and led will turn off.

However even with a faulty switch, irrigation can safely continue. The software will identify the faulty station and will apply a limited amount of irrigation. In serial this is 50% of the time base, i.e. if switch 3 were faulty and the time base set to 10 secs, irrigation would be applied for 5 seconds.

In parallel this is 10% or in the example above 1 second.

This process ensures that the glass house is not flooded but there is limited irrigation on the faulty station.

Once the faulty switch has been identified rotate the switch vigorously to the left and right, this switching action should clean the contacts. An application of WD40 may also help. To do this, pull off cap and 'squirt' down the flat of the spindle. Wipe off excess oil.

FAULTY VALVE (on 16 stations and above)

To select this function, insert the 2 way jumper taped to the Output board (FIG.3) into the header labelled VALVE SCAN and the 2 way jumper taped to the logic board into the header labelled VALVE TEST. If not required leave VALVE TEST header empty. If not fitted the controller will skip the valve test routine.

In **SERIAL** - If a faulty valve is detected either open circuit or short circuit, the station and valve are skipped and the next station is selected. At the end of the irrigation cycle the faulty valve is identified by the station indicator. If the valve on station 3 is faulty, station 3 led and sounder will beep and flash three times. This applies to all 16/48 stations. Once the fault condition has been rectified sounder and led will turn off.

Upon initiation of an irrigation cycle automatic error checking for all outputs occurs. In serial this consists of a 120mSec sequential pulse to all outputs. Outputs whose stations are set to zero are not checked.

In parallel, each output is checked as above in serial mode and then all outputs in a bank of four are checked (all four led's in the bank are on for 120mSec) for over current.

In serial mode short circuit or open circuit conditions give an error warning of 3 beeps and 3 alarm led flashes.

In **PARALLEL** where 1 or 3 stations are safely powering 3 valves with the 4th station open circuit (no valve), the 4th station indicator will flash 3X and alarm sounder will beep 3X. If one of the stations (1 to 3) is short circuited (faulty valve) error warning will be 3 flashes and 3 beeps (open circuit) followed by 4 flashes and 4 beeps (short circuit).

If all or one of the stations are left open circuit all station indicators will flash 3X and 3 beeps followed by 4 flashes and 4 beeps. The valve detection circuit will provide a common error for both short and open circuit.

PERCENTAGE ADDITION/SUBTRACTION

To select % addition/subtraction place jumper into MAN header on FIG.2

The operator can use a potentiometer labelled %, mounted on the front panel, to increase or decrease all valve times between SCALE +100% and SCALE -90%. On hot days you would increase the % control on dull overcast days you would decrease the % control.

When the control is set to "CALIBRATED" the irrigation time is the multiplication time shown on the timer scale as described above. Thus

1. if the time on station one was set to 1 and the time base set to 10 SECS, the % control set to CALIBRATED the irrigation time will be 10 secs.
2. If the % control were set to +100% the irrigation time would be 20 secs.
3. If the % control were set to -90% the irrigation time would be 1 second.

The % control will work on the 10 SECS, MINS and MINSX10 time bases, but it has no effect on the 0.2 SECS and SECS time base.

Because of the integration software, if the percentage is adjusted prior to an irrigation cycle the **RESET** button must be pushed, otherwise the percentage would be 'averaged'. This is explained in greater detail in the integration section.

INTEGRATION

To select integration place jumper into AUTO header on FIG.2 and disconnect the lead from HDR2, if fitted

Simply put, this allows appropriate sensors to adjust the percentage addition/subtraction control described above, automatically and in response to actual conditions..

A 0-5V dc signal is sampled every 5 minutes, indicated by a pulse of the **POWER/INT SAMPLE** led. up to a maximum of 42 hours. The controller monitors a signal from an evaporation device such as a Solarimeter an Evaposensor , Waterbug or a Delta T device over a set period, usually the period between the controller start times. If all parameters have been set up accurately such as the time base and multiplication factor on the station, the algorithm converts the voltage input into an accurate frequency and automatically calculates the exact amount of irrigation time to compensate for the evaporation period. If sampling exceeds 42 hours, which in effect means that no irrigation has been applied for this period, all information is cleared and the process repeats. The signal from the sensor is sampled, digitised and stored every 5 minutes over a maximum period of 42 hours. If during this period an irrigation cycle is initiated the sum of the digitised samples is divided by the number of samples taken and the resulting average is used to adjust the watering times.

Connect the output of your device to the terminals labelled INTEGRATOR and LOWRES/0V terminals located on the output board, refer to FIG.3

Quick Start:

- 1) Connect controller to the valves, pump and mains supply(refer to the relevant sections in the installation manual)
- 2) Set the time base
- 3) Set each station switch, remember the 0 – 9 positions on the switch x the time base. If time base set to 10 SECS and the station switch to 3 the irrigation time is 30 Secs
- 4) Push the reset button
- 5) Push the start button, refer FIG 1, digital clock will show PS1 for a max of 4 seconds.
- 6) Controller runs.

CONTROLLER CARE

Very low maintenance required.

At the end of season keep the mains power applied, this will prevent damp entering and corroding metal parts.

To keep the rotary switch contacts clean turn fully to both end stops, **DO NOT USE FORCE.**

DON'T use sharp or pointed objects to push the tactile switches, use fingers only

Alarm Conditions

- 1) Low reservoir 1 beep, continuous, Lo Res led lit
- 2) Faulty switch 2 beeps, alarm led and station indicator flashes twice.
- 3) Serial, open circuit valve/short circuit valve 3 beeps, alarm led and station indicator flashes 3X
- 4) Parallel Open or short circuit valve a combination of 3 and 4 beeps, 3 and 4 alarm led flashes.

ELECTRICAL SPECIFICATIONS.

Operates from a 240V ac mains supply.

Integral 600mA mains suppression filter.

F2 Mains fused input rated at 500mA slow blow 5 x 20mm

24V ac output for valves and pump relay F4 rated at 1.5A quick blow 5x20mm

Low voltage processor supply F3 rated at 1A quick blow 1 amp 5x20mm

30VA, 24v ac secondary toroidal transformer, maximum output 1Amp

Valve common is bonded to Earth

Rechargeable clock battery

Plastic double insulated enclosure, size 240mm x 190mm x 90mm

Declaration of Conformity

Name of manufacturer

E&TS Ltd

Full postal address

40 Acreville Rd

Bebington

Wirral

Cheshire CH63 2HY

Country of origin

UK

Description of product

Irrigation Controller

Conforms to the requirement of the EMC directive 89/336/EEC, of low voltage directive 73/23/EEC and harmonised European and national standards.

Applied standards:

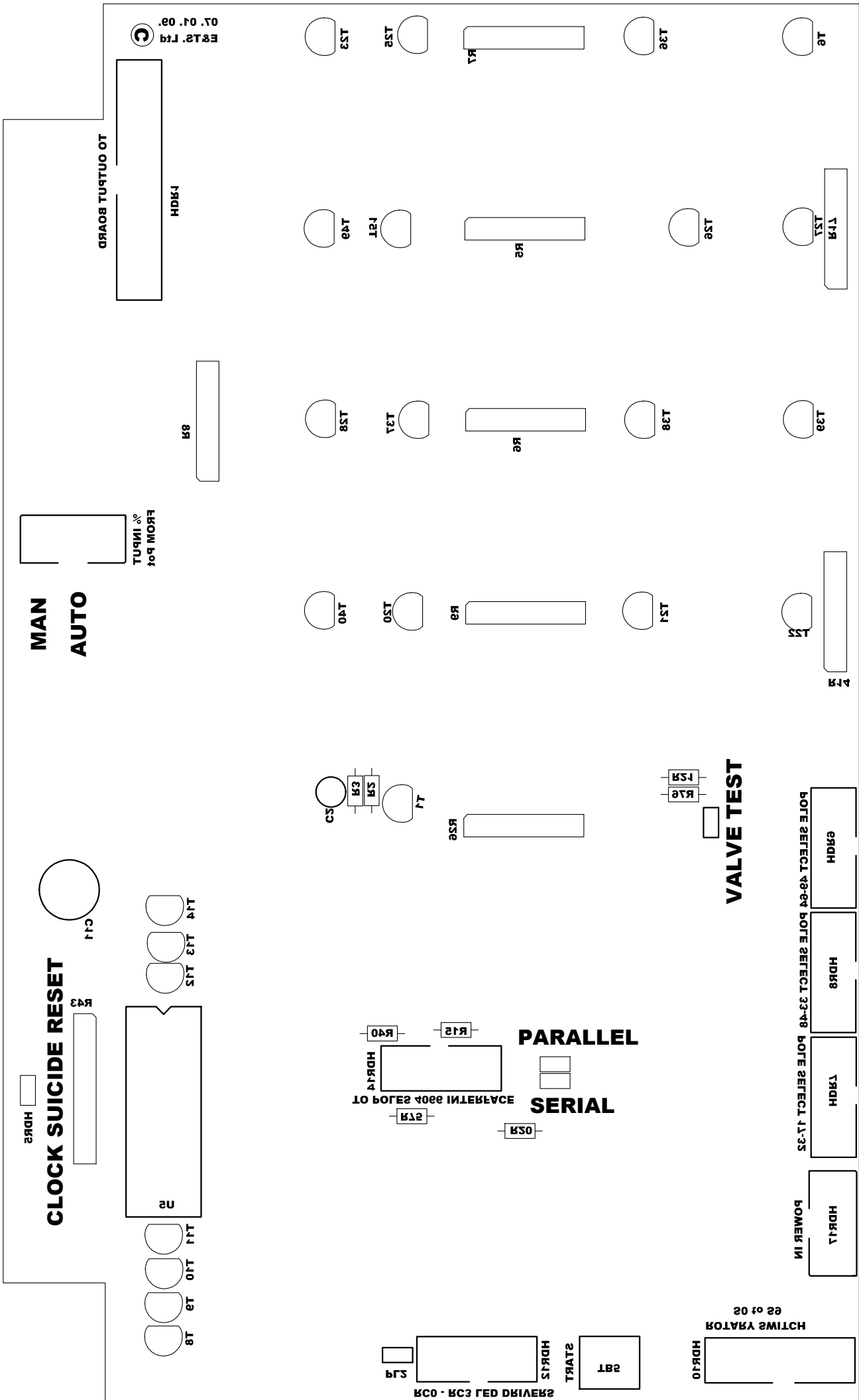
EN50081-1 EMC generic emission

EN50082-2 EMC generic immunity

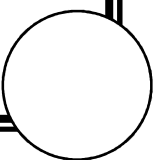
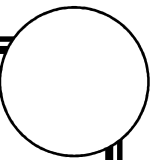
We declare that as the authorised representatives, the above information in relation to the manufacture of this product is in conformity with the stated standards and other related documents following the provision of EEC directives.

FIG.2

HDR2







HOURS MINS DAYS STARTS

HOURS

MINS

SET TIME

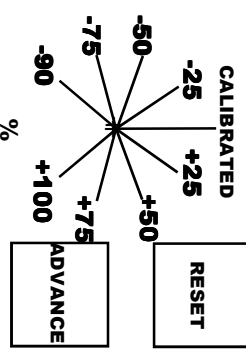
SET STARTS

COMMON STARTS

DAILY STARTS

START

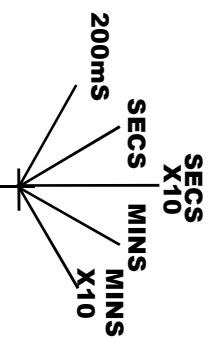
SET DAY RESET



FEED VALVE

PUMP CONTROL

E&TS Ltd
For all your irrigation needs



TIME BASE

